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ABSTRACT

There is one and only one common human language processing system and a variety of linguistic data to be processed. This system must operate opportunistically with certain areas of freedom. Within that system there is competition between the first and second languages on all levels and through all stages of development. Some processing procedures are universal across languages, and some are language-specific. In addition, there is much heterogeneity and variance among individuals. What the second language learner must learn is to make use of the processing capacity gained in the first language and to sort or filter out those processes that cannot handle second language processing tasks. The number of universal processes appears to be very large. Transfer is the use of these processes across languages, and interference is the lack or inadequacy of the sorting or filtering procedure. Any future theory of language acquisition should begin with the assumption that there are many similarities between first and second language processing, and that one's first language ability has an extremely important function in second language learning. These conclusions are supported in this paper via a detailed task analysis of a three-frame, non-captioned cartoon taken from Goldman-Eisler (1961).

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SOME PSYCHOLINGUISTIC CONSIDERATIONS TOWARDS A THEORY OF SECOND LANGUAGE PROCESSING

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SOME PSYCHOLINGUISTIC CONSIDERATIONS TOWARDS A THEORY OF SECOND LANGUAGE PROCESSING

Introduction

The tentative phrasing of this paper's title (Some ... considerations ... towards) is intended to reflect the tentative state of the art; but also that our data and the analysis of these data exemplify no more than first insights, considerations of a highly speculative nature which we have come to just recently. If these considerations should prove to be substantial, they should have some significance for a new theory of second language acquisition, a psycholinguistic one.

This paper attempts to demonstrate that natural speech in general, because of the limited capacity of the human information processing system, is error-ridden in many ways; and that errors as indications of general processing problems for this reason are not necessarily restricted to second language generation in particular.

Any future theory of second language processing, we feel, should take in consideration this fundamental principle.

Task analysis

The cartoon (cf p. 32f.), taken from Goldman-Eisler (1961), which was used to elicit the following first and second language speech data resembles what we might call a minimal narrative (cf. Labov & Waletzky 1967; Pier 1980): Each of the three episodes has an elementary story grammatical function:

episode 1 represents the introduction or exposition of the story
episode 2 the complication and
episode 3 the resolution.
Episode 1 (in Propp's terms) exposes an arrival, *episode 2* an action at the location arrived at and *episode 3* a departure after the action has taken place.

In *episode 1* the location of the action, the setting, the characters of the action, the man (the antagonist) and the woman (the protagonist), the major prop: the beard and the minor prop: the purse with the coin in it are introduced. The wishing-well script is additionally evoked by the inscription on top of the well. In *episode 2* the action leading to the complication is initiated: the coin is thrown into the well, the participation of the two characters and their role in the story (protagonist vs. antagonist) is partly signalled by their positions and facial expressions: the man, who does not know what is going on, takes over a passive role (antagonist); the woman, who is the active part, initiates the action. She is the protagonist. The *third episode* clearly discloses the result of the complication in episode 2. The woman has wished that her husband should lose his beard. This is the resolution. Only the moustache is left. The couple departs.

In order to solve this task one must know, of course, what a wishing well is and what it does. There are lots of wishing wells in England and in the United States, and in Italy, if I am not mistaken. There are practically none in Germany. Perhaps we are too acquisitive! There is no word for wishing well, either. I wonder whether our concept of wishing well is as clear as it is for a native speaker of English. If this was true the lack or indistinctness of a wishing-well script for a German speaker of English might cause some processing problems.

What's the message of the story? Is it a love story? Is the well a place to regain youth – the moustache – and get rid of old age – the beard. Are the man and the woman in the end rejuvenated because of her sacrifice of the coin and her never ending desire? – Or is it a women's-lib-story? Does she take over the role of hero traditionally belonging to him and rob him of the attribute of manhood, the beard, just leaving a little, tiny reminder of what he used to be, the moustache? Whatever this message may be, it certainly is part of the processing problem the narrator has to deal with even if he isn't aware of it.

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Version 1

1.1.1 TWO PEOPLE (0.3) A WOMAN AND A MAN (0.25) CAME TO A WELL (0.88)/

1.1.2 AND SUDDENLY STOPPED um (0.85) //

1.2.1 ABOVE (0.35) THE WELL was a (0.5) THERE (0.35) ONE COULD READ WISHING 'WELL (0.75) //

1.3.1 SUDDENLY THE WOMAN (0.42) TOOK A COIN A:ND uh (0.8) THREW IT IN THE WELL (2.14) //

1.4.1 THEN (0.72) THEY (0.52) WENT OFF //

6

Key to Symbols

(2.66)	Pause (2 $\frac{66}{100}$ sec)
uh	Filled Pause
THE WELL	Capital Letters: Intended Ideal Version
the	Small Letters: False Start, Parenthetical Remark etc.
	Unit Boundary Lines:
/	Rise – Fall
	Intonation Contour + Pause: Episodic Unit
	Fall – Rise
//	Falling Intonation Contour + Pause: Episode

Version 1, the shortest one of the four, makes up a nice little story. Passages of short phrase length are followed by short pauses. The story is planned and processed bit by bit. Consequently there are, with one exception, no self-corrections. In addition to the three episodes of the cartoon, a fourth episode is introduced. It deals with the main topic. The subject seems to realize that the inscription 'Wishing Well' gives the cue to the comprehension and reproduction of the story. However, his/her pronunciation with the main stress on Well clearly shows that he/she has not understood the story completely and therefore does not notice or avoids mentioning what happens to the beard.

In line 1.2.1. the false start *was a* together with the hesitations apparently reveals a lexical search problem. Quite in accordance with the narrative intention for this episode, the subject wants to talk about the sign bearing the inscription. When he/she realizes that he/she has no command of the particular expression sought, he/she quickly chooses a linguistic alternative. As soon as the lexical search fails, a different processor replaces the lexical processor. An avoidance strategy successfully solves the problem resulting from the inaccessibility of a particular word for a particular concept. This is done in a remarkably short period of pausing time.

Version 2

2.1.1 A MAN AND A WOMAN CAME ALONG THEIR WAY (0.4) /
2.1.2 SUDDENLY THEY CAME TO A WISHING WELL (1.4) //

2.2.1 THE MAN HAD A (0.66) LONG BEARD (1.25) //

2.3.1 THEY STOPPED by: AT THE WISHING WELL (0.45) A:ND THE LADY (0.92) THREW (0.15) A COIN IN THE WELL (1.1) //

2.4.1 after (0.27) thro AFTER (0.55) THROWING the cor THE COIN IN THE WELL (1.15) THEY CONTINUED THEIR (0.26) WAY (3.55) //

2.5.1 now we can see on the picture afterwards (1.64) AFTER SOME TIME (1.38) THE BEARD OF THE MAN HAD DISAPPEARED //

This version shows longer, more fluent passages. They are partly identical with sentences (2.1.1 ; 2.1.2 ; etc.), and partly shorter than grammatical sentences. On the average the interruptions or hesitations within sentence boundaries are comparatively short, though. Two independent statements are added to the cartoon's original three episodes; namely in line 2.2.1

THE MAN HAD A LONG BEARD . . .

(before the wish was contrived) and in line 2.5.1

AFTER SOME TIME THE BEARD OF THE MAN HAD DISAPPEARED.

Contrary to version 1 this subject has understood the message completely and makes it clear, without explaining the cause of the disappearance of the beard. Besides minor collocation difficulties that might reflect L1-interference, there is one major disruption in the flow of speech:

2.4.1 after (0.27) thro AFTER (0.55) THROWING the cor THE COIN

There seems to be a procedural uncertainty in the gradual activation of the participle construction processor

after ... thro AFTER ... THROWING

which results in the self-corrected word-level blend

after ... thro AFTER ... TH R O WING
cor
THE COIN

which is an indication of an undue amount of processing load and loss of peripheral control because of the complexity of the job.

In line 2.5.1 the parenthetical remark *now we see on the picture afterwards*, interrupting the flow of narration, creates a planning problem. The narrator who is about to report the unexpected effect of the lady's wish and therefore the realization of the wishing-well-script, in order to do so and present the resolution of the story, must take over the narrator's perspective again and connect the action before the interruption (line 2.4.1) with the following action (2.5.1) with the help of a connector in the story dimension. His/her decision for *AFTER SOME TIME* in place of *afterwards* sounds rather weird. This complicated operation, altogether, causes only a minor disruption.

Version 3

3.1.1 A MAN AND A WOMAN ARE WALKING UP TO A WISHING WELL (1.0)//

3.2.1 A::N (2.5) THE WOMAN IS SMILING (0.26) /
3.2.2 BUT they (1.64) THE MAN IS NOT SMILING (0.62) /
3.2.3 PERHAPS HE KNOWS THAT THE WOMAN IS GOING TO: (1.80) um (0.36) ASK HER SOME MONEY TO PUT IN THE WISHING WELL (5.0) //

3.3.1 THE WOMAN (0.62) HAS GOT THE they MONEY (0.76) /
3.3.2 AND SHE IS THROWING IT INTO THE WISHING WELL (0.96) /
3.3.3 THE MAN DOESN'T LOOK VERY INTERESTED (3.18) //

3.4.1 A::N (6.67) THEY ARE NOW WALKING AWAY FROM THE WELL (1.14) /
3.4.2 THE WOMAN IS SMILING (2.86) /
3.4.3 A::N (2.98) AGAIN THE MAN (1.98) ISN'T SMILING (12.18) /
3.4.4 A:ND IN THIS PICTURE THE MAN (0.46) IS NOT WEARING A BEARD (0.66) //

3.5.1 SO THE WOMAN (0.72) MUST HAVE WISHED (1.36) a::n THAT HIS BEARD WOULD DISAPPEAR (0.7) //

3.6.1 THE MAN DOESN'T LOOK VERY HAPPY ABOUT THIS //

Version 3, the longest of the four. has a number of lengthy uninterrupted, well-constructed stretches of speech (3.1.1; 3.3.2; 3.3.3; etc). There are other passages which are less smooth (3.4.3; 3.4.4; 3.5.1). The pauses in this version are considerably longer than those in any other production. Some of them are extremely long (line 3.4.3: 12. 18 sec.). Prolongations are effectively used to gain additional time for careful planning. Consequently there are no indications of repairs and self-corrections. This subject observes carefully every available source of information, including facial expressions and other reactions of the characters in the cartoon. He/she is the only one in the group who explains the joke (3.5.1).

Two passages in the story are of particular interest:

In line 3.2.3 he/she obviously intends to say "Perhaps he knows that the woman is going to ask him for some money to put in the wishing well." This explanatory remark (*Perhaps he knows*) is inferred from the husband's facial expression in the picture which is explicitly stated

THE MAN IS NOT SMILING

The conclusion drawn through this inference, however, does not correspond with the information given in the cartoon. There is no indication whatsoever that the lady, who is carrying a purse with her, wants her husband to give her the money. This is the subject's own invention. General knowledge-

of-the-world leading out of the immediate context suggested by the picture is introduced: the money-claiming-wife script. As we have found with quite a few of our productions this kind of verbalisation task comes close to a projective test and induces a particular dimension of processing problems. The obvious planning problem in line 3.4.2, revealed by the pauses, the filled pause *um* and the drawl *TO*: as well as the false referential choice

ASK *HER* (for) SOME MONEY

instead of *ask him for some money* results from the competition of two plans. This competition right at this spot is due to a competition and final collision of two underlying scripts: the wishing-well script and the money-claiming-wife script. In this connection the wrong referential choice is by no means a random one but rather the consequence of a blend on the sentence level

The	woman	is	going	to	ask	him	(for)	some	money.
The	woman	is	going	to	ask (for)	her			money.

THE WOMAN IS GOING TO ASK HER SOME MONEY

According to Fay (1981. 719) such "a blend occurs when a speaker has in mind simultaneously two ways of expressing the same message. Instead of one or the other expression being used, they are combined in some way to give a new, synthesized utterance that does not match exactly either of the intended expressions." I wonder whether in the particular case above – and in other cases we have found – it is really the same message that is expressed in two different ways. It seems to me rather that the message itself is ambiguous because of a higher-level processing ambiguity. Unfortunately we do not know much about blends in general (cf. Mackay 1972; Garrett 1980; Fay 1981), and in second-language production in particular. Neither do we know anything about the potential influence of L1 as a particular condition for the occurrence of particular blends. They are a strong case for the competition of speech planning.

A second interesting example for competitive planning is found in line 3.2.2

BUT they (1.64) THE MAN . .

The false start *they* represents a reference to the beginning line 3.1.1 A MAN AND A WOMAN . . .
although in line 3.2.1, i.e. immediately before the quoted utterance in line 3.2.1 THE WOMAN has already been mentioned in isolation. The attribution of the function of protagonist to the woman

THE WOMAN IS SMILING

is finished; the attribution of the function of antagonist to the man

THE MAN IS NOT SMILING

is under way. Both attributions have the important narrative function of delineating the complication of the story and preparing its resolution. And yet the original referent including both

A MAN AND WOMAN

is still active. The immediate correction of the false start *they* exemplifies that the subject "knows" after a break what the true referent suggested by the particular stage of development is. The "wrong" choice *they* nevertheless demonstrates at the same time that the original referent still is, psychologically speaking, active. Or to put it differently, the speaker feels the need to keep the *they* reference active which must have an important function for him in the sense of keeping alive a powerful higher-level coreferential network. This hypothesis is further verified in line

3.3.1 THE WOMAN (0.62) HAS GOT THE they MONEY

At this stage of the story there seems to be little evidence for a semantic resemblance as in line 3.2.2. But on a closer look THE WOMAN initiating this

episode explicitly is part of the semantic network THE MAN AND THE WOMAN referred to by *they*, which shows that the competition between the *they*-plan is additionally enforced by the collision of scripts just mentioned in which the pronouns *him* and *her* struggle with each other and leave the confusion between *they* vs. he (*him*) and she (her) unsettled.

*Version 4**

4.1.1 MY HUSBAND AN I ONCE (0.56) APPROACHED (0.20) A WISHING WELL (2.36) //

4.2.1 I wondered (0.06) I WAS WONDERING IF THI:S (1.70) uh WELL (0.48) /
4.2.2 COULD REALLY FULFILL (0.46) wishes p (0.78) my wish MY WISHES (0.40) //

4.3.1 SO (0.45) I put a I throw (0.26) THREW A COIN (0.30) INTO THE WELL (0.68) AND MADE A WISH (2.43) //

4.4.1 SUDDENLY (0.74) MY HUSBAND (1.86) LOOKED (0.40) QUITE PUZZLED (0.68) AND SURPRISED (1.22) /
4.4.2 BECAU:SE (1.35) MY WISH (1.35) HAD BECOME TRUE (0.58) //

4.5.1 HE HAD NO LONGER A LONG BEARD (0.80) ONLY HIS (0.20) MOUSTACHE (0.30) WAS LEFT //

Version 4 may be described as consisting of comparatively short planning units that partly resemble regular syntactic sentence constituents and partly seem to contradict a regular grammatically based parsing strategy. The interrupting pauses are relatively short. Characteristic for this kind of lower-level ad hoc planning are the three "test runs"

(a) I wondered – I WAS WONDERING (4.2.1/2)
(b) ... IF THIS WELL COULD REALLY FULFILL wishes – my wish my wish – MY WISHES
(c) So I put a – I throw ...
I throw – THREW A COIN ...

in which a competition of two processors and a final solution for one of them (the past continuous) as in (a) or a two stage competition of three processors in succession is revealed, as in (b) and (c).

Although the time intervals between the planning units, compared with version 3 for instance, are rather short in version 4 and therefore only seem to reflect lower level planning, there are indications of higher level processing beyond unit boundary lines. The subphonemic slip-of-the-tongue *p* in line 4.2.3, for example, is a first anticipation of the competition between the "*put*-plan" and "*throw*-plan" in line 4.3.1.

The three episodes of the original cartoon story are expanded into five processing episodes in the reproduction. The second story episode is added; episode 3 in the cartoon is split into two parts, the 4th and 5th story episode. It is interesting that exactly these additions and changes that aim at introducing an explanatory dimension cause processing problems.

The second episode in the text reflects a conceptual problem the subject has: The verbal information *Wishing Well* on top of the roof above the well should provide a very helpful cue for the comprehension and reproduction of the story. Why doesn't the subject just read *I was wondering if this wishing well* ... It takes a long time until he/she finally comes to the decision

2.2.1 I WAS WONDERING IF THIS WELL

Does the subject weigh whether or not this wishing well, as the cartoon explicitly suggests, may be called so? And if not, as the story suggests, why? Or does he/she have classificatory reasons, reasons of topicalisation, does he/she have a reintroduction problem after the well was called a wishing well in the first line? Has his/her choice anything to do with the establishment of a clear given-new distinction? Or does he/she "only" try to avoid repetition for stylistic reasons? Or is the later competition as to what the lady is doing: *put* or *throw* the coin in (or into?) the well already part of this processing problem, as the immediately following slip *p* may suggest? And isn't there also an evident parallel process dealing with another semantic problem the narrator is working on? Is it one wish or more wishes the lady in the story

has? Does one say to *fulfill* wishes? Does one say to fulfill *wishes* or *my wishes*? And moreover, do wishing wells accept wishes in general, any wish any time, or just once in a while, or only this particular one, the one the lady (and the narrator) have in mind? It is obviously a whole battery of processors dealing with a variety of problems on different levels. Some of them are activated and packed together at this particular point. No wonder that the extreme processing load reflecting the complexity of the task the subject has to solve results in heavy peripheral disruptions of speech.

In taking over the lady's role fictitiously in making the story one of her own

4.1.1 *MY* HUSBAND AN *I* ONCE APPROACHED ...

this subject, in connection with applying the epic past, chooses a particular perspective that gives the illusion of a "real" life story. This decision certainly activates a powerful narrative device on the semantic level. Is such a perspective characteristic for L1 productions only? Or may it be transferred from L1 to L2 in order to reduce the "normal" lower level processing problems to a certain amount that relieves the narrator from an overload of difficulties? Very little is known about this.

Analysis of Temporal Variables

One of the underlying working hypotheses in the discussion of my data has been that there are many similarities in first and second language processing and that it is awfully complicated to detect and describe particular second-language processing features which are not found in first-language processing if you go beyond the phonological level. In light of the discussion of my data I wonder what your reaction would be if I asked you whether there are any first language productions in my corpus, and if so: how many? And: which ones?

Let me try to approach this problem from a different point of view.

Table 1. ANALYSIS OF TEMPORAL VARIABLES

	a	b	c	d	e	f	g	h	i	j
Version 1	43	13	3.07	24.46 s	15.63 s	63.90 %	8.83 s	36.10 %	1.76	2.75
Version 2	71	15	4.44	39.55 s	24.42 s	61.74 %	15.13 s	38.26 %	1.79	2.90
Version 3	116	23	4.83	81.80 s	31.39 s	38.37 %	50.41 s	61.63 %	1.42	3.69
Version 4	68	25	2.62	43.71 s	22.75 s	52.05 %	20.96 s	47.95 %	1.55	2.99

a – number of words
b – number of pauses
c – $\frac{\text{words}}{\text{pauses} + 1}$ = phrase length
d – total production time
e – speaking time (d - g)
f – % speaking time of total production time
g – pause time
h – % pause time of total production time
i – $\frac{\text{words}}{\text{total time}}$ = speech rate
j – $\frac{\text{words}}{\text{speaking time}}$ = articulation rate

If you compare the figures in each of the columns with each other a large number of similarities and a smaller number of striking differences can be found. The latter, of course, are of particular interest. They may be summarized like this:

(a) Version 3 is comparatively *long*.
(c) The average length of utterance in version 4 is comparatively *short*.
(d) The total production time of version 3 is comparatively *long*.
(f) The percentage of speaking time in version 3 is comparatively *low*.
(g) The absolute pause time in version 3 is comparatively *long*.
(h) The relative pause time in version 3 is comparatively *long*.
(i) The speech rate in version 3 is comparatively *low*.
(j) The articulation rate in version 3 is comparatively *high*.

This means that in light of an analysis of the temporal variables inherent in all four productions, version 3 consistently varies from the other three. It has the lowest speech rate and the highest articulation rate and it is the longest one. This subject is what Herb Seliger calls a planner. He/she takes his/her

time to plan carefully and to avoid errors and later corrections. But when he/she talks he/she does that with a high speed: this subject is fluent, in spite of the low percentage of speaking time. Version 3, to conclude, is the only native speaker of English in this corpus.

The subjects

Version 1 and version 2 were produced by one and the same subject, *George*, at that time an undergraduate English major in the University of Kassel. At the time of the recording, in January and in April 1978, immediately before and immediately after a visit to the United States, he was 23 years of age. In 1978 he had been at Kassel University for two academic terms (one year). He had had nine years of English in High School (Gymnasium), with average grades in English as well as in German. Before his trip to America he had not been to an English speaking country at all.

The comparison between the two reproductions shows a certain improvement in phrase length, articulation rate and, what I have called elsewhere, editing skill. The most striking difference, of course, is that only the second production shows that George has fully understood the cartoon.

Version 3, recorded in June 1977, was produced by Carolyn, a British exchange student from the University of Reading. Unfortunately no further personal data were collected at that time.

Version 4 was produced in December 1976. At that time Barbara, an English major in Kassel, also was 23 years old. At the time of the recording she had had eight years of English in High School (Gymnasium) and four years of intensive English language training by native speakers of English (British and American) at Kassel University. A few months before the recording Barbara had come back from a 6 month study period in a Midwestern College as an exchange student. Her exposure to the English language therefore was not only considerably longer than George's but high above average in general. Not long after the recording Barbara passed her final examination with above average grades. She has been an English teacher ever since.

Conclusion

What does all this mean? If it is possible to gain some insight into the mental processes of language planning and production by looking at errors and temporal variables, then we should continue to collect and analyse data in our endeavour towards a theory of language processing and acquisition.

Such a theory cannot in principle be different for the first and second language since there is one and only one common human language processing system and various linguistic data to be processed. In order to be responsive to its task environment, this system such as all executive systems must operate opportunistically with certain degrees of freedom at its periphery. It is likely to produce competition of plans and errors. No hearer or speaker is errorless.

The assumption that errors are characteristic for a certain insufficient not yet completed stage of acquisition in interlanguage or second-language development *only* or *mainly* is therefore wrong. There is rather competition of plans on all levels in L1 and L2 through all stages of development. And there is, consequently, a tremendous amount of heterogeneity and variance from each particular individual to the other.

First and second language processing, from a procedural perspective, is identical with respect to the activation, shaping, filtering and packaging of elementary processes. Many are used universally across languages; and others are language specific. What one has to learn in acquiring a second language is to make use of the processing capacity gained in L1 and to sort or filter out those processes which cannot do the equivalent L2 jobs.

The number of universal language processes seems to be very large. Transfer then means the use of such universal processes across languages; interference means the lack or inadequate state of the sorting out procedure mentioned previously.

For all these reasons every human information processing system is a compound one.

Any future theory of language acquisition should start with the assumption that there are a lot of similarities between first and second language processing, that one's primary language ability has – and should be considered to have – an extremely important function in second-language acquisition.

NOTES

* These data have been presented in a paper entitled "First and Second Language Processing: Similarities and Differences" during the First AILA Commission on Psycholinguistics International Conference in Milan, November 1-3, 1982.

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